

CLAIMS

I Claim:

1       1. A device for combining a plurality of arithmetic flags, comprising:  
2              a combination function module that examines a plurality of arithmetic flags,  
3       determines field size of the plurality of arithmetic flags and based on the  
4       determination of the field size will combine the plurality of arithmetic flags into a  
5       single combined arithmetic flag variable, wherein the plurality of arithmetic flags  
6       represent the status of a plurality of data items after a mathematical operation is  
7       performed by the processor on the plurality of data items.

1       2. The device recited in claim 1, further comprising:  
2              a condition check module that determines the status of the combined  
3       arithmetic flag variable and causes the processor to execute an appropriate  
4       operation based on the status.

1       3. The device recited in claim 1, wherein the field size is based either a  
2       nibble, byte, half word, or word in length.

1       4. The device recited in claim 3, wherein the plurality of arithmetic flags  
2       further comprise:  
3              a negative data value, a zero data value, a carry out occurrence in a data  
4       value, or an overflow condition in a data item in the plurality of data items.

1           5. The device recited in claim 4, the combination function module performs  
2 either an AND or an OR operation.

1           6. The device recited in claim 2, wherein the status determined by the  
2 condition further comprises:

- 3           any data item has overflowed;  
4           any data item has not overflowed;  
5           any data item is positive or zero;  
6           any data item is negative;  
7           any data item is zero;  
8           any data item is not zero;  
9           any data item has a carry out;  
10          any data item does not have a carry out;  
11          all data items have overflowed;  
12          all data items have not overflowed;  
13          all data items are positive or zero;  
14          all data items are negative;  
15          all data items are zero;  
16          all data items are not zero;  
17          all data items have a carry out; and  
18          all data items do not have a carry out.

1        7. A method of combining a plurality of arithmetic flags for presentation to  
2        a processor, comprising:

3              determining a field size of the plurality of arithmetic flags on which to base a  
4        combination process, wherein the plurality of arithmetic flags represent the status of  
5        a plurality of data items after a mathematical operation is performed by the  
6        processor on the plurality of data items;

7              extracting the plurality of arithmetic flags based on the field size;

8              combining the plurality of arithmetic flags based on a function selected when  
9        a combination process is selected; and

10             storing a result of the combining of the plurality of arithmetic flags in a  
11       destination register for access by the processor.

1        8. The method recited in claim 7, wherein the field size is based either a  
2        nibble, byte, half word, or word in length.

1        9. The method recited in claim 8, wherein the plurality of arithmetic flags  
2        further comprise:

3              a negative data value, a zero data value, a carry out occurrence in a data  
4        value, or an overflow condition in a data item in the plurality of data items.

1        10. The method recited in claim 9, wherein the function further comprises:  
2        an AND or OR operation.

1           **11.**   The method recited in claim 10, wherein the function may be used to  
2   determine the status of the plurality of data items, said status comprising:  
3           any data item has overflowed;  
4           any data item has not overflowed;  
5           any data item is positive or zero;  
6           any data item is negative;  
7           any data item is zero;  
8           any data item is not zero;  
9           any data item has a carry out;  
10          any data item does not have a carry out;  
11          all data items have overflowed;  
12          all data items have not overflowed;  
13          all data items are positive or zero;  
14          all data items are negative;  
15          all data items are zero;  
16          all data items are not zero;  
17          all data items have a carry out; and  
18          all data items do not have a carry out.

1           **12.**   An apparatus comprising a data storage medium for storing  
2   instructions when executed by a processor results in, comprising:

3       determining a field size of the plurality of arithmetic flags on which to base a  
4   combination process, wherein the plurality of arithmetic flags represent the status of  
5   a plurality of data items after a mathematical operation is performed by the  
6   processor on the plurality of data items;  
7       extracting the plurality of arithmetic flags based on the field size;  
8       combining the plurality of arithmetic flags based on a function selected when  
9   a combination process is selected; and  
10      storing a result of the combining of the plurality of arithmetic flags in a  
11   destination register for access by the processor.

1       **13.**   The apparatus recited in claim 12, wherein the field size is based either  
2   a nibble, byte, half word, or word in length.

1       **14.**   The apparatus recited in claim 13, wherein the plurality of arithmetic  
2   flags further comprise:

3       a negative data value, a zero data value, a carry out occurrence in a data  
4   value, or an overflow condition in a data item in the plurality of data items.

1       **15.**   The apparatus recited in claim 14, wherein the function further  
2   comprises an AND or OR operation.

1       16. The apparatus recited in claim 15, wherein the function may be used  
2       to determine the status of the plurality of data items, said status comprising:  
3           any data item has overflowed;  
4           any data item has not overflowed;  
5           any data item is positive or zero;  
6           any data item is negative;  
7           any data item is zero;  
8           any data item is not zero;  
9           any data item has a carry out;  
10          any data item does not have a carry out;  
11          all data items have overflowed;  
12          all data items have not overflowed;  
13          all data items are positive or zero;  
14          all data items are negative;  
15          all data items are zero;  
16          all data items are not zero;  
17          all data items have a carry out; and  
18          all data items do not have a carry out.

1       17. A method of extracting a plurality of arithmetic flags for presentation to  
2       a processor, comprising:

3       determining a field size of the plurality of arithmetic flags on which to base a  
4   combination process, wherein the plurality of arithmetic flags represent the status of  
5   a plurality of data items after a mathematical operation is performed by the  
6   processor on the plurality of data items;

7       extracting the plurality of arithmetic flags based on the field size; and  
8       storing a result of the extracting of the plurality of arithmetic flags in a  
9   destination register for access by the processor.

1           **18.**   The method recited in claim 17, wherein the field size is based either  
2   a nibble, byte, or half word in length.

1           **19.**   The method recited in claim 18, wherein the plurality of arithmetic flags  
2   further comprise:

3       a negative data value, a zero data value, a carry out occurrence in a data  
4   value, or an overflow condition in a data item in the plurality of data items.

1           **20.**   A method of extracting a plurality of arithmetic flags for presentation  
2   to a processor, comprising:

3       determining a field size of the plurality of arithmetic flags on which to base a  
4   combination process, wherein the plurality of arithmetic flags represent the status of  
5   a plurality of data items after a mathematical operation is performed by the  
6   processor on the plurality of data items;

7           extracting the plurality of arithmetic flags based on the field size; and  
8           storing a result of the extracting of the plurality of arithmetic flags in a  
9           destination register for access by the processor.

1           **21.**   The method recited in claim 20, wherein the field size is based either  
2           a nibble, byte, or half word in length.

1           **22.**   The method recited in claim 21, wherein the plurality of arithmetic flags  
2           further comprise:  
3           a negative data value, a zero data value, a carry out occurrence in a data  
4           value, or an overflow condition in a data item in the plurality of data items.